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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,572	03/01/2004	Moon-Sook Lee	5649-1267	9878

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EXAMINER

ECKERT II, GEORGE C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/790,572

Applicant(s)

LEE, MOON-SOOK

Examiner

George C. Eckert II

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-25,30 and 31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-25,30 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/1/04, 8/10/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions – Response to Amendment*

1. Applicant's amendment dated April 18, 2005 in which claims 1-16 and 26-29 were canceled has been entered of record, the amendment making the restriction requirement moot. It is noted that the restriction requirement mailed March 23, 2005 incorrectly included claims 30 and 31 with the group I, method invention while they should have been grouped with the group II, device invention. Claims 30 and 31, as stated by applicant, are properly included with the group II, device invention, elected by applicant, and will be treated instantly.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "intaglio" in claims 17, 18, 20, 22, 23, 25, 30 and 31 seems to be used by the claim to mean an etched or otherwise formed opening in an oxide or dielectric layer, while the accepted meaning is "an engraving or incised figure in stone or other hard material depressed below the surface so that an impression from the design yields an image in relief." *Merriam Webster's Collegiate Dictionary*, 10<sup>th</sup> Edition. The term is indefinite because the specification does not clearly

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redefine the term. In other words, the term “intaglio” as defined by the dictionary seems to imply an engraving or other structure formed into or below a surface of a material while applicant’s use of the term seems to imply merely a one or two-step recess or groove, the recess or groove not having an engraving or structure. For purposes of this action, the term will be assumed to mean a groove or opening formed in a layer.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 17-21 and 30, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by 6,215,646 to Ochiai et al. Regarding claims 17 and 30, Ochiai teaches in figure 5b an integrated circuit device comprising:

an integrated circuit substrate 11;

an interlayer dielectric layer 16 on the substrate having a plurality of buried contacts 21 therein;

an oxide layer 17 on the interlayer dielectric;

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an intaglio or opening formed in the oxide layer 17 over the buried contacts (the layer 17 may be considered to have an opening defined by the outer sides of layers 18, e.g. the layer 17 on the perimeter of the figure may be considered an intaglio; and

a plurality of lower electrodes 18 within an opening in the intaglio pattern, the lower electrodes electrically contacting the buried contacts 21.

Regarding claim 18, Ochiai teaches that the lower electrodes 18 have a semi-cylindrical shape. Regarding claims 19 and 30, Ochiai teaches that the device includes a ferroelectric memory device comprising a ferroelectric layer 19 (col. 5, lines 32-44) and an upper electrode 20 over the lower electrode to form a ferroelectric memory. Regarding claim 20, Ochiai teaches that the lower electrodes comprise a horizontal component (the bottom of layer 18) contacting the buried contact 21 and a vertical component, extending from the horizontal component and on the sidewall of the intaglio pattern (e.g. the opening in layer 17). Regarding claim 21, Ochiai teaches transistors 10A in the substrate contacting the buried contacts 21.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 22-25 and 31, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai in view of 6,861,690 to Park. Ochiai taught the device of claim 17 but did not teach that the intaglio had multi-steps including exposing an upper surface of the buried

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contact. Park teaches in figure 2 a capacitor lower electrode 280 contacting a buried contact 160/180 wherein sidewalls of the buried contact are exposed and thus form a multi-step intaglio. Park also teaches that the electrode 280 has vertical and horizontal components (280av and 280ah, respectively) that contact the buried contact as claimed.

Ochiai and Park are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the device of Ochiai having a two-step intaglio such that the sides of the buried contact were exposed. The motivation for doing so, as is taught by Park, is that an exposed buried contact will create a larger contact area between the lower electrode and buried layer (col. 1, lines 61-64) and thus reduce the tendency of the lower electrode to lean or collapse (col. 1, lines 51-57). Therefore, it would have been obvious to combine Ochiai and Park to obtain the invention of claims 22-25 and 31

### *Conclusion*


5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited art teaches various structures of memory devices formed having intaglios in oxide or other dielectric layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Eckert II whose telephone number is (571) 272-1728.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**GEORGE ECKERT**  
**PRIMARY EXAMINER**